ESL-TR-83

HERBICIDE ORANGE MONITORING PROGRAM ADDENDUM I

ALBERT N. RHODES

MAY 1985

ADDENDUM REPORT

JANUARY 1980 - FEBRUARY 1985

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SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution unlimited.
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S)	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION — 6b. OFFICE SYMBOL (If applicable): RPVW	7a. NAME OF MONITORING ORGANIZATION
6c. ADDRESS (City, State and ZIP Code)	7b. ADDRESS (City, State and ZIP Code)
8a. NAME OF FUNDING/SPONSORING ORGANIZATION — 8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c. ADDRESS (City, State and ZIP Code)	10. SOURCE OF FUNDING NOS.

PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WORK UNIT NO.
62601F	1900	20	[illegible]

11. TITLE (Include Security Classification): ... Monitoring Program Addend. I

12. PERSONAL AUTHOR(S)

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Yr., Mo., Day)	15. PAGE COUNT
	FROM ... TO Feb 83	May 1985	45

16. SUPPLEMENTARY NOTATION

... specified on reverse of front cover

17. COSATI CODES

18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)

Herbicide Orange	Agent Orange	Dioxin
TCDD	2,4-D	2,4,5-T
...	Pacer HO	...

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

... Herbicide Orange Monitoring Program and ... at Eglin AFB FL, Naval Construction Battalion Center ... Sampling methods which were not published ... report. This report only contains raw data and site ... are made in Addendum I.

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20. DISTRIBUTION/AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION
22a. NAME OF RESPONSIBLE INDIVIDUAL — 22b. TELEPHONE NUMBER	22c. OFFICE SYMBOL

PREFACE

This report is Addendum I of ESL-TR-83-56 Herbicide Orange Monitoring Program. Addendum I contains Herbicide Orange data from Eglin AFB, Florida, Naval Construction Battalion Center, Gulfport, Mississippi, and Johnston Island, Pacific Ocean. Environmental samples were collected by personnel from the Air Force Occupational and Environmental Health Laboratory (OEHL) and the Air Force Engineering and Services Center, Engineering and Services Laboratory (ESL) from July 1977 through February 1985. Technical efforts were conducted solely by ESL from January 1980 through February 1985 under JON 19002031, PE 62601F. AFESC/RDVW Project Officer was 2nd Lt Albert N. Rhodes.

This report was prepared to make all ESL Herbicide Orange data available to the public. These data may be useful to the scientific community for decision making and problem solving when faced with similiar contaminants. No recommendations or conclusions are made in this report.

This report has been reviewed by the Public Affairs Office (PA) and is releasable to the National Technical Information Service (NTIS). At NTIS it will be available to the general public, including foreign nationals.

This technical report has been reviewed and is approved for publication.

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LIST OF ABBREVIATIONS

ppb	PARTS PER BILLION
ppm	PARTS PER MILLION
ppq	PARTS PER QUADRILLION
ppt	PARTS PER TRILLION
BE	BUTYL ESTERS
C-52A	TEST RANGE C-52A, EGLIN AFB
CAL	CALIFORNIA ANALYTICAL LABORATORIES
DCP	DICHLOROPHENOL
DS	DRAINAGE SYSTEM
DW	DOWNWIND OF STORAGE SITE
EAFB	EGLIN AFB, FLORIDA
ESL	ENGINEERING AND SERVICES LABORATORY
FL	FENCELINE
G1	GRID ONE
HS 7	HARDSTAND SEVEN, EGLIN AFB
HpCDD	HEPTACHLORODIBENZO-p-DIOXINS, ALL ISOMERS
HpCDF	HEPTACHLORODIBENZO-p-FURANS, ALL ISOMERS
HxCDD	HEXACHLORODIBENZO-p-DIOXINS, ALL ISOMERS
HxCDF	HEXACHLORODIBENZO-p-FURANS, ALL ISOMERS
JI	JOHNSTON ISLAND
NCBC	NAVAL CONSTRUCTION BATTALION CENTER, GULFPORT, MISSISSIPPI
ND	NONDETECTABLE AT SPECIFIED DETECTION LIMITS
NR	INTERNAL STANDARD WAS NOT RECOVERABLE
OCDD	OCTACHLORODIBENZO-p-DIOXIN
OCDF	OCTACHLORODIBENZO-p-FURAN
OEHL	AIR FORCE OCCUPATIONAL AND ENVIRONMENTAL HEALTH LABORATORY
OS	OCEAN SEDIMENT
PCDD	PENTACHLORODIBENZO-p-DIOXINS, ALL ISOMERS
PCDF	PENTACHLORODIBENZO-p-FURANS, ALL ISOMERS
Q1	QUADRANT ONE
Q2	QUADRANT TWO
Q3	QUADRANT THREE
Q4	QUADRANT FOUR
SS	STORAGE SITE
TCDD	TETRACHLORODIBENZO-p-DIOXINS, ALL ISOMERS UNLESS SPECIFIED
TCDF	TETRACHLORODIBENZO-p-FURANS, ALL ISOMERS UNLESS SPECIFIED
TCP	TRICHLOROPHENOL
TH	TEST HOLE
UOU	UNIVERSITY OF UTAH, FLAMMABILITY RESEARCH CENTER
UW	UPWIND OF STORAGE SITE
WSU	BREHM LABORATORY, WRIGHT STATE UNIVERSITY
2,3,7,8-TCDD	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN
2,4-D	2,4-DICHLOROPHENOXYACETIC ACID
2,4,5-T	2,4,5-TRICHLOROPHENOXYACETIC ACID

DETECTION LIMITS
(Unless Otherwise Specified)

LAB	2,4-D	2,4,5-T	2,3,7,8-TCDD
WSU	NOT ANALYZED	NOT ANALYZED	0.01 ppb
CAL	0.1 ppb	0.1 ppb	0.1 ppb

SECTION I

INTRODUCTION[1]

A. BACKGROUND

In April 1970, the Secretaries of Agriculture; Health, Education, and Welfare; and the Interior jointly announced the suspension of certain uses of 2,4,5-trichlorophenoxyacetic acid (2,4,5-T). This suspension resulted from published studies indicating that 2,4,5-T was a teratogen. Subsequent studies revealed that the teratogenic effects resulted from a toxic contaminant in the 2,4,5-T identified as 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD). Subsequently, the Department of Defense suspended the use of Herbicide Orange, which contained 2,4,5-T. At the time of suspension, the Air Force had an inventory of 1.37 million gallons of Herbicide Orange in South Vietnam and 0.85 million gallons at the Naval Construction Battalion Center (NCBC), Gulfport, MS. In September 1971, the Department of Defense directed that the herbicide in South Vietnam be returned to the United States and that the entire 2.22 million gallons be disposed of in an environmentally safe and efficient manner. The 1.37 million gallons were moved to Johnston Island, Pacific Ocean in April 1972. The average concentration of 2,3,7,8-TCDD in the Herbicide Orange was about 2 parts per million with the total amount of 2,3,7,8-TCDD in the entire Herbicide Orange stock estimated at 44.1 pounds.

Herbicide Orange is a reddish-brown to tan liquid, soluble in diesel fuel and organic solvents, but insoluble in water. One gallon of Herbicide Orange theoretically contained 4.21 pounds of the active ingredient 2,4-D and 4.41 pounds of the active ingredient 2,4,5-T. Herbicide Orange was formulated to contain a 50:50 mixture (by weight) of the n-butyl esters of 2,4-D and 2,4,5-T. The percentages of the formulation typically were:

n-butyl ester of 2,4-D	49.49
free acid of 2,4-D	0.13
n-butyl ester of 2,4,5T	48.75
free acid of 2,4,5-T	1.00
inert ingredients (e.g., butyl alcohol and ester moieties)	0.63

Various disposal techniques for Herbicide Orange were investigated from 1971 to 1974. Destructive techniques included soil biodegradation, high-temperature incineration, deep-well injection, burial in underground nuclear test cavities, sludge burial, and microbial reduction. Techniques used to recover a useful product included activated charcoal filtration, return to manufacturers, fractionation, and chlorinolysis.

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[1] This section was taken from ESL-TR-[illegible], _Herbicide Orange Monitoring Program_ and edited for use in this report.

Of these techniques, only high-temperature incineration was sufficiently developed to warrant further investigation. The other methods were rejected because of several considerations, including long lead times for development, inadequate assurance of success, and the lack of industrial intrest.

During the summer of 1977 the United States Air Force disposed of 2.22 million gallons of Herbicide Orange by high-temperature incineration at sea. This operation, Project PACER HO, was accomplished under very stringent regulation by the U.S. Environmental Protection Agency ocean-dumping permits.

The Air Force plan and the EPA permits for the disposal of the herbicide committed the Air Force to a follow-on storage site reclamation and environmental monitoring program. The major objectives of this program were to:

(1) Determine the magnitude of herbicide contamination (2,3,7,8-TCDD) in and around the former herbicide test and storage sites.

(2) Determine the rate of natural degradation for the phenoxy herbicides (2,4-D and 2,4,5-T), their phenolic degradation products, and 2,3,7,8-TCDD in soils of the storage and test sites.

(3) Monitor for potential movement of residues from the storage and test sites into adjacent water, sediments, and biological organisms.

(4) Recommend managerial techniques for minimizing any impact of the herbicides and dioxin residues on the ecology and human populations near the storage and test sites.

Immediately following the at-sea incineration in 1977, the USAF Occupational and Environmental Health Laboratory initiated site-monitoring studies of chemical residues in soil, silt, water, and biological organisms associated with the former storage sites where the herbicide had been stored at the Naval Constructon Battalion Center (NCBC) and Johnston Island (JI). A similar monitoring program began at Eglin AFB, FL in 1973 for a 92-acre site on Test Area C-52A and in 1975 for a 2-acre area on Hardstand 7.

Secretary of the Air Force/Deputy for Environment and Safety (SAF/MIQ) requested and received from Air Force/Surgeon General, in June 1980, a proposed research protocol to return Herbicide Orange-contaminated sites to full and beneficial use. Based on this research protocol, SAF/MIQ recommended that the Air Force Engineering and Services Laboratory (ESL) be designated as lead laboratory for monitoring and reclamation research. Air Force Deputy of Staff for Engineering/Logistics agreed that the Environics Division of ESL was eminently qualified to handle the complex integration of environmental chemistry and control technology required to address the problem. It was noted,

however, that the ESL is dedicated to a research mission and not routine field assistance tasks. This required that site monitoring be consolidated within the dioxin research program, rather than in routine analysis, which is the mission of the OEHL. Before initiation of the overall research program the ESL routed the research requirement through Air Force Deputy Chief of Staff for Research and Development and Air Force Systems Command/Director of Laboratories in the form of a Statement of Operational Need (SON). The validated USAF SON 2-81 directed that (1) a sampling and analysis program be initiated, (2) a small program to look at methods to destroy dioxin in situ be started, but no full-scale effort take place unless further directed by the Secretary of the Air Force, and (3) progress on assessing long-term breakdown and movement of 2,3,7,8-TCDD be discussed yearly at the Headquarters Air Force Engineering and Services Center, ESL-Systems Command 6.2 technical review. Following the 1981 technical review, ESL was directed to (1) proceed with the Herbicide Orange program as a minimal effort involving site monitoring and assessment of the contaminated sites and (2) provided further direction not to carry out actual cleanup unless directed by Headquarters USAF.

The Environics Division for the ESL continued the site monitoring and evaluation program until February 1985 by collecting samples from NCBC, JI, and Eglin AFB on a semiannual basis. This report contains all Herbicide Orange data collected by the personnel of OEHL and ESL from July 1977 through February 1985.

SECTION II

SAMPLING METHODS[1]

WATER SAMPLES

The Air Force Engineering and Services Center, Engineering and Services Laboratory began collecting water samples in November 1983 to examine 2,3,7,8-TCDD migration in surface water. Samples were collected from the storm drains at the Naval Construction Battalion Center and streams and ponds which collect runoff from Hardstand Seven and Test Range C-52A at Eglin AFB.

Due to the low solubility of 2,3,7,8-TCDD in water (octanol/water partitioning coefficient of 1.4×10^6), 10 L of water are needed per sample. Samples were collected in 13 L hexane-rinsed and oven-dried glass bottles. The bottles were filled with water by either submerging the mouth of the bottle below the water surface or bailing water into the bottle with glass jars. After filling, the bottles were sealed with aluminum foil-wrapped butyl rubber stoppers. The stoppers were wired in place and the samples were stored in a walk-in refrigerator (37°F) until shipment to the laboratory. Samples were shipped to Brehm Laboratory, Wright State University, unrefrigerated, by overnight air freight.

Water samples were analyzed one of two ways depending on the amount of suspended sediment in a sample. Clean samples (less than 10 grams suspended sediment per sample)[2] were analyzed without filtering. Turbid samples (more than 10 grams suspended sediment per sample) were first filtered to remove the sediment. Two analyses were then run on the sample: one on the sediment and the other on the water. The decision to filter was at the discretion of Brehm Laboratory.

AIR SAMPLES

Air samples were collected at Johnston Island during February and March 1984 to examine the migration of 2,3,7,8-TCDD on airborne particulates. Three samples were collected downwind (prevailing winds on JI are Northeasterly at 15-20 knots) of the old Herbicide Orange storage site near the island nondirectional beacon building. A fourth sample was collected at the upwind side of the island to act as a control.

All samples were collected with a Ground Filter Unit (GFU) supplied by the Air Force Tactical Applications Center. The flow rate of the GFU was 325 $ft^3 min^{-1}$ on a 60 Hz 220 V power supply. The GFU inlet was approximately 3.5 feet above ground level.

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[1] This section only contains sampling methods which were not explained in ESL-TR-83-56.

[2] Ten grams is the minimum sample size needed to perform soil and sediment analyses.

Samples were collected on filters designed specifically for use in the GFU when airborne particulates are sampled. The filters were composed of a cellulose fiber matrix which was treated with Kronisol™ (dibutoxy ethyl phthalate). The filter is capable of trapping all airborne particulates down to the 0.01-0.1 um range.

Runtime for all samples was approximately 168 hours (one week). At the end of the run, the filter was removed are replaced with a clean filter. The filters were then mailed to Brehm Laboratory in coated envelopes (provided by the filter manufacturer) for analysis.

LOCATION & DATE	SAMPLING LAB	SAMPLE DESCRIPTION	2,4-D (ppm)	2,4,5-T (ppm)	2,3,7,8-TCDD (ppb)	ANALYT. LAB
C-52A Q1						
MAY 81	ESL	SOIL			0.01	WSU
DEC 81	ESL	SOIL			ND	WSU
MAY 82	ESL	SOIL			ND	WSU
MAY 83	ESL	SOIL			0.04	WSU
C-52A Q2						
MAY 81	ESL	SOIL			ND	WSU
DEC 81	ESL	SOIL			ND	WSU
MAY 82	ESL	SOIL			0.02	WSU
MAY 83	ESL	SOIL			0.01	WSU
C-52A Q3						
MAY 81	ESL	SOIL			0.04	WSU
DEC 81	ESL	SOIL			0.02	WSU
MAY 82	ESL	SOIL			0.04	WSU
MAY 83	ESL	SOIL			0.03	WSU
C-52A Q4						
MAY 81	ESL	SOIL			0.02	WSU
DEC 81	ESL	SOIL			ND	WSU
MAY 82	ESL	SOIL			ND	WSU
MAY 83	ESL	SOIL			0.025	WSU
C-52A C1						
MAY 81	ESL	SOIL			0.05	WSU
		SOIL 0-3 IN.			0.05	WSU
		SOIL 3-6 IN.			ND	WSU
		SOIL 6-12 IN.			ND	WSU
DEC 81	ESL	SOIL			0.16	WSU
		SOIL 0-3 IN.			ND	WSU
		SOIL 3-6 IN.			ND	WSU
		SOIL 6-12 IN.			ND	WSU
MAY 82	ESL	SOIL			0.25	WSU
		SOIL 0-1 IN.			0.05	WSU
		SOIL 1-3 IN.			0.17	WSU
		SOIL 3-6 IN.			0.1	WSU
		SOIL 6-12 IN.			ND	WSU
		SOIL 0-1 IN.	ND	ND	ND	CAL
		SOIL 1-3 IN.	ND	ND	ND	CAL
		SOIL 3-6 IN.	ND	ND	ND	CAL
		SOIL 6-12 IN.	ND	ND	ND	CAL
MAY 83	ESL	SOIL			0.15	WSU
		SOIL 0-1 IN.			0.22	WSU
		SOIL 1-3 IN.			0.37	WSU
		SOIL 3-6 IN.			ND	WSU
		SOIL 6-12 IN.			0.11	WSU
SEP 84	ESL	SOIL 2-3 IN. CENTER			ND-46ppt	WSU
		SOIL 3-4 IN.			ND-13ppt	WSU
		SOIL 6-7 IN.			ND-8.7ppt	WSU
		SOIL 2-3 IN. NE			ND-14ppt	WSU
		SOIL 3-5 IN.			ND-7.5ppt	WSU
		SOIL 6-7 IN.			0.008	WSU

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			SOIL 2-3 IN. SE	ND-13ppt	WSU
			SOIL 4-5 IN.	ND-6.3ppt	WSU
			SOIL 6-7 IN.	ND-5.3ppt	WSU
			SOIL 2-3 IN. SW	0.023	WSU
			SOIL 4-5 IN.	0.008	WSU
			SOIL 6-7 IN.	ND-4.1ppt	WSU
			SOIL 2-3 IN. NW	0.001	WSU
			SOIL 4-5 IN.	0.059	WSU
			SOIL 6-7 IN.	ND	WSU
C-52A G2					
	SEP 84	ESL	SOIL 2-3 IN.	ND-45ppt	WSU
			SOIL 4-5 IN.	ND	WSU
			SOIL 6-7 IN.	ND-1.2ppt	WSU
C-52A P					
	MAY 81	ESL	SOIL	ND	WSU
			SOIL, TREELINE	ND	WSU
	DEC 81	ESL	SOIL	ND	WSU
			SOIL, TREELINE	ND	WSU
C-52A POND					
	DEC 81	ESL	SEDIMENT	0.03	WSU
HEAD BASIN					
	MAY 81	ESL	SEDIMENT	ND	WSU
			BIOLOGICAL(COMPOSITE)	ND	WSU
	DEC 81	ESL	SEDIMENT	ND	WSU
			BIOLOGICAL(CRAYFISH)	ND	WSU
	MAY 82	ESL	SEDIMNET	ND	WSU
	NOV 82	ESL	SEDIMENT	ND	WSU
			BIOLOGICAL(COMPOSITE)	ND	WSU
	MAY 83	ESL	SEDIMENT	ND	WSU
			BIOLOGICAL(CRAYFISH)	ND	WSU
	DEC 83	ESL	SEDIMENT	ND-3ppt	WSU
			BIOLOGICAL(COMPOSITE)	ND	WSU
			WATER	ND-25ppq	WSU
LOWER BASIN					
	DEC 83	ESL	SEDIMENT	ND-7ppt	WSU
			WATER	ND-25ppq	WSU
BASIN BRIDGE					
	MAY 81	ESL	SEDIMENT	ND	WSU
			BIOLOGICAL(CRAYFISH)	ND	WSU
	DEC 81	ESL	SEDIMENT	ND	WSU
			BIOLOGICAL(COMPOSITE)	ND	WSU
	MAY 82	ESL	BIOLOGICAL(CRAYFISH)	ND	WSU
HEAD MULLET					
	MAY 81	ESL	SEDIMENT	ND	WSU
			BIOLOGICAL(CRAYFISH)	ND	WSU
	DEC 81	ESL	SEDIMENT	ND	WSU
			BIOLOGICAL(CRAYFISH)	ND	WSU

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	MAY 82	ESL	SEDIMENT	ND	WSU
			BIOLOGICAL(CRAYFISH)	ND	WSU
	NOV 82	ESL	SEDIMENT	ND	WSU
			BIOLOGICAL(FISH)	ND	WSU
	MAY 83	ESL	SEDIMENT	ND	WSU
			BIOLOGICAL(CRAYFISH)	ND	WSU
	DEC 83	ESL	SEDIMENT	ND-7ppt	WSU
			BIOLOGICAL(CRAYFISH)	ND	WSU
			WATER	ND-25ppq	WSU
LOWER MULLET					
	DEC 83	ESL	SEDIMENT	ND-6ppt	WSU
			WATER	ND-25ppq	WSU
BOUND MULLET					
	MAY 81	ESL	SEDIMENT	ND	WSU
			SEDIMENT	ND	WSU
	DEC 81	ESL	SEDIMENT	ND	WSU
			BIOLOGICAL(COMPOSITE)	ND	WSU
HEAD TROUT					
	MAY 81	ESL	SEDIMENT	ND	WSU
			BIOLOGICAL(COMPOSITE)	ND	WSU
	DEC 81	ESL	SEDIMENT	ND	WSU
			BIOLOGICAL(COMPOSITE)	ND	WSU
	MAY 82	ESL	SEDIMENT	ND	WSU
			BIOLOGICAL(FISH)	ND	WSU
			BIOLOGICAL(CRAYFISH)	ND	WSU
	NOV 82	ESL	SEDIMENT	ND	WSU
			BIOLOGICAL(CRAYFISH)	ND	WSU
	MAY 83	ESL	SEDIMENT	ND	WSU
			BIOLOGICAL(FISH)	ND	WSU
	DEC 83	ESL	SEDIMENT	ND-7ppt	WSU
			BIOLOGICAL(COMPOSITE)	ND	WSU
			WATER	ND-25ppq	WSU
LOWER TROUT					
	DEC 83	ESL	SEDIMENT	ND-7ppt	WSU
			WATER	ND-25ppq	WSU
BOUND TROUT					
	MAY 81	ESL	BIOLOGICAL(CRAYFISH)	ND	WSU
	DEC 81	ESL	SEDIMENT	ND	WSU
			BIOLOGICAL(CRAYFISH)	ND	WSU
HS7 D1					
	MAY 82	ESL	SOIL 0-3 IN.	138	WSU
			SOIL 3-6 IN.	159	WSU
			SOIL 9-12 IN.	126	WSU
			SOIL 21-24 IN.	46	WSU
			SOIL 33-36 IN.	15	WSU
			SOIL 45-48 IN.	96	WSU
			SOIL 69-72 IN.	102	WSU
			SOIL 105-108 IN.	136	WSU

		SOIL 105-108 IN.	92	357	88	CAL
MAY 83	ESL	SOIL 0-3 IN.			258	WSU
		SOIL 9-12 IN.			194	WSU
		SOIL 21-24 IN.			139	WSU
		SOIL 45-48 IN.			52	WSU
		SOIL 69-72 IN.			36.3	WSU
		SOIL 93-96 IN.			17	WSU
		SOIL 117-120 IN.			8.93	WSU
		SOIL 141-144 IN.			12.2	WSU
		SOIL 165-168 IN.			0.37	WSU
		SOIL 189-192 IN.			1.86	WSU
		SOIL 0-3 IN.	640	3100	188	CAL
		SOIL 9-12 IN.	2900	6200	146	CAL
		SOIL 21-24 IN.	18000	22000	115	CAL
		SOIL 45-48 IN.	1000	1300	37.7	CAL
		SOIL 69-72 IN.	916	800	10.6	CAL
		SOIL 93-96 IN.	420	520	10.5	CAL
		SOIL 117-120 IN.			9.13	WSU
		SOIL 141-144 IN.			5.6	WSU
		SOIL 165-168 IN.			0.44	WSU
		SOIL 189-192 IN.			0.96	WSU
HS7 K1						
MAY 82	ESL	SOIL 0-3 IN.			58	WSU
		SOIL 3-6 IN.			58	WSU
		SOIL 9-12 IN.			72	WSU
		SOIL 21-24 IN.			115	WSU
		SOIL 33-36 IN.			92	WSU
		SOIL 45-48 IN.			37	WSU
		SOIL 69-72 IN.			37	WSU
		SOIL 105-108 IN.			10	WSU
MAY 83		SOIL 0-3 IN.			66.5	WSU
		SOIL 9-12 IN.			86.4	WSU
		SOIL 21-24 IN.			154	WSU
		SOIL 45-48 IN.			114	WSU
		SOIL 69-72 IN.			2.7	WSU
		SOIL 93-96 IN.			2.9	WSU
		SOIL 117-120 IN.			0.21	WSU
		SOIL 141-144 IN.			0.79	WSU
		SOIL 165-168 IN.			0.78	WSU
		SOIL 189-192 IN.			0.15	WSU
		SOIL 0-3 IN.	2550	8900	54.4	CAL
		SOIL 9-12 IN.	8000	22000	78.3	CAL
		SOIL 21-24 IN.	7200	20000	110	CAL
		SOIL 45-48 IN.	8100	14000	47.2	CAL
		SOIL 69-72 IN.	3400	1600	1.7	CAL
		SOIL 93-96 IN.	1950	1030	1.3	CAL
		SOIL 117-120 IN.			0.04	WSU
		SOIL 141-144 IN.			0.09	WSU
		SOIL 165-168 IN.			0.09	WSU
		SOIL 189-192 IN.			0.68	WSU
HS7 P1						
DEC 81	ESL	SOIL			46	WSU
MAY83	ESL	SOIL			22.5	WSU

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HS7 P2						
DEC 81	ESL	SOIL			0.025	WSU
MAY 82	ESL	SOIL			0.02	WSU
HS7 PAD						
NOV 82	ESL	SOIL 0-3 IN.	7.6	59	10	CAL
		SOIL 3-6 IN.	14	160	10.8	CAL
		SOIL 6-9 IN.	2.5	16	10.1	CAL
		SOIL 9-12 IN.	2.1	16	13.1	CAL
		SOIL 15-18 IN.	1.9	15	4.1	CAL
		SOIL 21-24 IN.	630	8600	10.4	CAL
		SOIL 33-36 IN.	980	130000	9.2	CAL
		SOIL 45-48 IN.	1600	22000	13.2	CAL
		SOIL 57-60 IN.	1650	13000	12.9	CAL
		SOIL 69-72 IN.	260	1700	2.9	CAL
		SOIL 81-84 IN.	3.6	37	ND	CAL
		SOIL 93-96 IN.	ND	3	ND	CAL
		SOIL 105-108 IN.	ND	2	ND	CAL
HS POND						
MAY 81	ESL	SEDIMENT			0.16	WSU
		BIOLOGICAL(FISH)			0.04	WSU
DEC 81	ESL	SEDIMENT			0.03	WSU
		BIOLOGICAL(FISH)			0.04	WSU
MAY 82	ESL	SEDIMENT			0.2	WSU
		BIOLOGICAL(FISH)			0.12	WSU
		BIOLOGICAL(FISH)			0.05	WSU
NOV 82	ESL	BIOLOGICAL(FISH)			0.23	WSU
MAY 83	ESL	BIOLOGICAL(FISH)			0.27	WSU
DEC 83	ESL	SEDIMENT			0.3	WSU
		SEDIMENT 0-1.5 IN.			0.025	WSU
		SEDIMENT 1.5-22.5 IN.			0.071	WSU
		SEDIMENT 22.5-24 IN.			0.095	WSU
		BIOLOGICAL(FISH)			0.2	WSU
HS7 FAR BANK						
SEP 84						
1	ESL	SOIL			ND-380ppt	WSU
2		SOIL			ND-6.1ppt	WSU
3		SOIL			ND-2.8ppt	WSU
4		SOIL			ND-3.4ppt	WSU
5		SOIL			ND-3.2ppt	WSU
6		SOIL			ND-6.1ppt	WSU
7		SOIL			ND-4.1ppt	WSU
8		SOIL			ND-1.0ppt	WSU
9		SOIL			ND-2.5ppt	WSU
10		SOIL			ND-1.7ppt	WSU
11		SOIL			ND-4.8ppt	WSU
12		SOIL			ND-4.0ppt	WSU
MIDDLE POND						
MAY 81	ESL	SEDIMENT			ND	WSU
		BIOLOGICAL(FISH)			ND	WSU

DEC 81	ESL	SEDIMENT	0.025	WSU
		BIOLOGICAL(TURTLE)	ND	WSU
MAY 82	ESL	SEDIMENT	ND	WSU
		BIOLOGICAL(FISH)	ND	WSU
NOV 82	ESL	SEDIMENT	ND	WSU
		BIOLOGICAL(FISH)	ND	WSU
MAY 83	ESL	BIOLOGICAL(FISH)	ND	WSU
TOM'S BRIDGE				
MAY 81	ESL	SEDIMENT	ND	WSU
DEC 81	ESL	SEDIMENT	ND	WSU
		BIOLOGICAL(FROG)	ND	WSU
CHOCTAW. BAY				
DEC 83	ESL	BIOLOGICAL(SHELLFISH)	ND	WSU

SECTION IV

HERBICIDE ORANGE DATA

NAVAL CONSTRUCTION BATTALION CENTER

GULFPORT, MISSISSIPPI

LOCATION & DATE	SAMPLING LAB	SAMPLE DESCRIPTION	2,4-D (ppm)	2,4,5-T (ppm)	2,3,7,8-TCDD (ppb)	ANALYT. LAB
NCBC SS 1						
JUL 77	OEHL	SOIL	10500	6120	109	UOU
JAN 78	OEHL	SOIL	5920	6460	328	UOU
NOV 78	OEHL	SOIL	4050	19600	198	UOU
SEP 80	OEHL	SOIL			178	WSU
MAY 81	ESL	SOIL			123	WSU
		SOIL			134	WSU
		SOIL	280	200	190	CAL
		SOIL	760	1100	170	CAL
NOV 81	ESL	SOIL	130	200	240	CAL
		SOIL			154	WSU
APR 82	ESL	SOIL			130	WSU
		SOIL	22	74	176	CAL
NOV 82	ESL	SOIL			176	WSU
NCBC SS 2						
JUL 77	OEHL	SOIL	8.2	20.3	NO DATA	UOU
JAN 78	OEHL	SOIL	0.8	0.4	NO DATA	UOU
NOV 78	OEHL	SOIL	1.4	2.8	NO DATA	UOU
NCBC SS 3						
JUL 77	OEHL	SOIL	13100	13900	631	UOU
JAN 78	OEHL	SOIL	ND-0.1	0.6	4.8	UOU
NOV 78	OEHL	SOIL	1.5	0.3	2.2	UOU
NCBC SS 4						
JUL 77	OEHL	SOIL	7.4	6.6	NO DATA	UOU
JAN 78	OEHL	SOIL	0.1	0.8	NO DATA	UOU
NOV 78	OEHL	SOIL	1.2	4.8	NO DATA	UOU
NCBC SS 5						
JUL 77	OEHL	SOIL	7810	3600	ND-8.4	UOU
JAN 78	OEHL	SOIL	6120	18500	ND-2.0	UOU
NOV 78	OEHL	SOIL	805	2340	ND-38.7	UOU
SEP 80	OEHL	SOIL			2.6	UOU
NOV 81	ESL	SOIL	600	2000	0.1	CAL
		SOIL			1.5	WSU
APR 82	ESL	SOIL			2.5	WSU
		SOIL	330	1640	2.4	CAL
NOV 82	ESL	SOIL			2	WSU
NCBC SS 6						
JUL 77	OEHL	SOIL	0.3	0.4	NO DATA	UOU
JAN 78	OEHL	SOIL	2.7	3.4	NO DATA	UOU
NOV 78	OEHL	SOIL	3.6	1.4	NO DATA	UOU
NCBC SS 7						
JUL 77	OEHL	SOIL	9	11.5	NO DATA	UOU
JAN 78	OEHL	SOIL	570	1110	ND-5.0	UOU
NOV 78	OEHL	SOIL	3.1	4.8	NO DATA	UOU
NCBC SS 8						
JUL 77	OEHL	SOIL	674	369	190	UOU
JAN 78	OEHL	SOIL	0.2	0.5	4.6	UOU
NOV 78	OEHL	SOIL	0.6	0.4	5.2	UOU

NCBC SS 9						
JUL 77	OEHL	SOIL	2.9	5.4	NO DATA	UOU
JAN 78	OEHL	SOIL	0.3	0.2	NO DATA	UOU
NOV 78	OEHL	SOIL	0.4	0.4	NO DATA	UOU
NCBC SS 10						
JUL 77	OEHL	SOIL	2140	1420	18.5	UOU
JAN 78	OEHL	SOIL	4370	1730	42	UOU
NOV 78	OEHL	SOIL	719	2860	24.2	UOU
NCBC SS 11						
JAN 78	OEHL	SOIL	8.8	19.6	NO DATA	UOU
NOV 78	OEHL	SOIL	0.9	2.6	NO DATA	UOU
NCBC SS 12						
JUL 77	OEHL	SOIL	2.0	2.2	NO DATA	UOU
JAN 78	OEHL	SOIL	0.6	0.4	ND-.2	UOU
NOV 78	OEHL	SOIL	0.2	0.6	NO DATA	UOU
SEP 80	ESL	SOIL			0.65	WSU
MAY 81	ESL	SOIL	ND-.01	ND-.013	0.067	CAL
		SOIL	ND-1.0	ND-.1	ND-.01	CAL
		SOIL			0.05	WSU
		SOIL			0.04	WSU
		SOIL			0.09	WSU
NOV 81	ESL	SOIL			0.14	WSU
APR 82	ESL	SOIL			ND-.1	WSU
		SOIL			0.25	WSU
NOV 82	ESL	SOIL				
NCBC SS 13						
JAN 78	OEHL	SOIL	7.2	6.4	NO DATA	UOU
NOV 78	OEHL	SOIL	2.6	4.2	NO DATA	UOU
NCBC SS 14						
JAN 78	OEHL	SOIL	1420	3790	100	UOU
NOV 78	OEHL	SOIL	29.6	40.2	105	UOU
NCBC SS 15						
JAN 78	OEHL	SOIL	0.9	1.2	NO DATA	UOU
NOV 78	OEHL	SOIL	0.2	0.3	NO DATA	UOU
NCBC SS 16						
JAN 78	OEHL	SOIL	6950	11800	442	UOU
NOV 78	OEHL	SOIL	7920	20300	198	UOU
NCBC SS 17						
JAN 78	OEHL	SOIL	31000	22500	510	UOU
NOV 78	OEHL	SOIL	29100	50300	508	UOU
JUN 79	OEHL	SOIL	27000	32900	325	UOU
SEP 80	ESL	SOIL			421	WSU
MAY 81	ESL	SOIL			160	WSU
		SOIL			227	WSU
		SOIL	5600	3200	97	CAL
		SOIL	4400	4200	200	CAL
NOV 81	ESL	SOIL			168	WSU

2

		SOIL	1200	1700	260	CAL
APR 82	ESL	SOIL			337	WSU
		SOIL	796	2770	271	CAL
NOV 82	ESL	SOIL			184	CAL
NCBC SS 18						
JAN 78	OEHL	SOIL	112	0.5	ND-.02	UOU
NOV 78	OEHL	SOIL	1.8	2.6	NO DATA	UOU
NCBC SS 19						
JAN 78	OEHL	SOIL	7530	14400	130	UOU
NOV 78	OEHL	SOIL	6760	13000	119	UOU
NCBC SS 20						
JAN 78	OEHL	SOIL	21000	53000	1	UOU
NOV 78	OEHL	SOIL	45200	3.7	NO DATA	UOU
NCBC SS 21						
JAN 78	OEHL	SOIL	0.8	2.7	NO DATA	UOU
NOV 78	OEHL	SOIL	1	2.6	NO DATA	UOU
NCBC SS 22						
JAN 78	OEHL	SOIL	2680	10300	ND-2.0	UOU
NOV 78	OEHL	SOIL	6690	33700	ND-18	UOU
NCBC SS 23						
JAN 78	OEHL	SOIL	0.3	0.1	NO DATA	UOU
NOV 78	OEHL	SOIL	0.4	1	NO DATA	UOU
NCBC SS 24						
JAN 78	OEHL	SOIL	4010	ND-2.0	NO DATA	UOU
NOV 78	OEHL	SOIL	1690	1840	ND-12.8	UOU
NCBC SS 25						
JAN 78	OEHL	SOIL	0.7	0.5	NO DATA	UOU
NOV 78	OEHL	SOIL	1.1	3.6	NO DATA	UOU
NCBC SS 26						
JAN 78	OEHL	SOIL	11400	30500	11	UOU
NOV 78	OEHL	SOIL	8840	2970	14	UOU
NCBC SS 27						
JAN 78	OEHL	SOIL	871	660	130	UOU
NOV 78	OEHL	SOIL	359	266	29	UOU
NCBC SS 28						
JAN 78	OEHL	SOIL	0.5	0.6	NO DATA	UOU
NOV 78	OEHL	SOIL	0.3	0.6	NO DATA	UOU
NCBC SS 29						
JAN 78	OEHL	SOIL	46.4	79.8	ND-4.0	UOU
NOV 78	OEHL	SOIL	0.7	2	NO DATA	UOU

NCBC SS 30						
JAN 78	OEHL	SOIL	3530	8790	240	UOU
NOV 78	OEHL	SOIL	2610	8770	222	UOU
NCBC SS 31						
JAN 78	OEHL	SOIL	200	698	ND-2.0	UOU
NOV 78	OEHL	SOIL	384	504	NO DATA	UOU
NCBC SS 32						
JAN 78	OEHL	SOIL	1.3	6.2	NO DATA	UOU
NOV 78	OEHL	SOIL	6.7	34.9	NO DATA	UOU
NCBC SS 33						
JAN 78	OEHL	SOIL	5.7	3.4	NO DATA	UOU
NOV 78	OEHL	SOIL	0.3	0.7	NO DATA	UOU
NCBC SS 34						
JAN 78	OEHL	SOIL	117	494	ND-8.0	UOU
NOV 78	OEHL	SOIL	3.3	6	NO DATA	UOU
NCBC SS 35						
JAN 78	OEHL	SOIL	50.6	175	ND-340	UOU
NOV 78	OEHL	SOIL	5	15.6	NO DATA	UOU
NCBC SS 36						
JAN 78	OEHL	SOIL	23.1	55.8	ND-10	UOU
NOV 78	OEHL	SOIL	1.1	3.9	NO DATA	UOU
NCBC SS 37						
JAN 78	OEHL	SOIL	1490	7850	ND-8.0	UOU
NOV 78	OEHL	SOIL	1470	5820	21.8	UOU
NCBC SS 38						
JAN 78	OEHL	SOIL	1320	6120	ND-11	UOU
NOV 78	OEHL	SOIL	859	4160	24.2	UOU
NCBC SS 39						
JAN 78	OEHL	SOIL	6.1	15.6	ND-40	UOU
NOV 78	OEHL	SOIL	0.5	2.2	NO DATA	UOU
NCBC SS 40						
JAN 78	OEHL	SOIL	40.8	128	ND-3.0	UOU
NOV 78	OEHL	SOIL	0.3	0.7	NO DATA	UOU
NCBC SS 41						
JAN 78	OEHL	SOIL	5030	6800	230	UOU
NOV 78	OEHL	SOIL	5790	13900	251	UOU
SEP 80	ESL	SOIL			193	WSU
MAY 81	ESL	SOIL	3400	2100	80	CAL
		SOIL	2700	1600	180	CAL
		SOIL			54	WSU
		SOIL			165	WSU
NOV 81	ESL	SOIL	600	1100	140	CAL
		SOIL			123	WSU
APR 82	ESL	SOIL	110	570	150	CAL

		SOIL			249	WSU
NOV 82	ESL	SOIL			164	WSU
NCBC SS 42						
JAN 78	OEHL	SOIL	0.6	2.5	NO DATA	UOU
NOV 78	OEHL	SOIL	0.3	NO DATA	NO DATA	UOU
NCBC SS 43						
JAN 78	OEHL	SOIL	9.2	15.7	ND-43	UOU
NOV 78	OEHL	SOIL	2270	6860	5.9	UOU
NCBC SS 44						
JAN 78	OEHL	SOIL	12	30.5	NO DATA	UOU
NOV 78	OEHL	SOIL	3510	7470	9.1	UOU
NCBC DS 1						
SEP 80	ESL	SEDIMENT			0.74	WSU
		BIOLOGICAL(FISH)			2.17	WSU
MAY 81	ESL	SEDIMENT			1.15	WSU
		BIOLOGICAL(COMPOSITE)			1.2	WSU
NOV 81	ESL	SEDIMENT			2.2	WSU
		BIOLOGICAL(FROG)			0.53	WSU
APR 82	ESL	SEDIMENT			0.48	WSU
		BIOLOGICAL(NOT SPECIFIED)			0.57	WSU
		BIOLOGICAL(TURTLE LIVER)			0.57	WSU
		BIOLOGICAL(TURTLE VISCERA)			0.24	WSU
		BIOLOGICAL(TURTLE MUSCLE)			0.08	WSU
NOV 82	ESL	SEDIMENT			1.5	WSU
		BIOLOGICAL(COMPOSITE)			0.9	WSU
APR 83	ESL	BIOLOGICAL(FISH)			2	WSU
MAR 84	ESL	SUSPENDED SEDIMENT			10.6	WSU
		WATER			ND-30ppq	WSU
NCBC DS 2						
SEP 80	ESL	SEDIMENT			0.31	WSU
		SEDIMENT			0.34	WSU
		BIOLOGICAL(TADPOLE)			0.37	WSU
		BIOLOGICAL(FISH)			11.6	WSU
		BIOLOGICAL(TURTLE LIVER)			2.49	WSU
		BIOLOGICAL(TURTLE MUSCLE&BONE)			0.36	WSU
MAY 81	ESL	SEDIMENT			0.16	WSU
		BIOLOGICAL(FISH)			0.6	WSU
NOV 81	ESL	SEDIMENT			1.2	WSU
		BIOLOGICAL(TADPOLE)			0.26	WSU
		BIOLOGICAL(CRAYFISH)			0.07	WSU
		BIOLOGICAL(FISH)			0.52	WSU
APR 82	ESL	SEDIMENT			0.14	WSU
		BIOLOGICAL(TADPOLE)			0.06	WSU
		BIOLOGICAL(NOT SPECIFIED)			0.62	WSU
NOV 82	ESL	SEDIMENT			0.18	WSU
		BIOLOGICAL(COMPOSITE)			0.41	WSU
		BIOLOGICAL(TURTLE LIVER)			0.61	WSU
		BIOLOGICAL(TURTLE ADIPOSE)			0.07	WSU
		BIOLOGICAL(TURTLE MUSCLE)			0.05	WSU

APR 83	ESL	BIOLOGICAL(COMPOSITE)	0.4	WSU
MAR 84	ESL	SEDIMENT	0.16	WSU
		WATER	ND-50ppq	WSU
		BIOLOGICAL(COMPOSITE)	0.39	WSU
NCBC DS 3				
SEP 80	ESL	SEDIMENT	0.02	WSU
		BIOLOGICAL(FROG)	0.01	WSU
APR 82	ESL	SEDIMENT	ND	WSU
		BIOLOGICAL(NOT SPECIFIED)	ND	WSU
NOV 82	ESL	SEDIMENT	ND	WSU
		BIOLOGICAL(TURTLE LIVER)	1.32	WSU
		BIOLOGICAL(TURTLE ADIPOSE)	4.4	WSU
		BIOLOGICAL(MUSCLE)	0.06	WSU
APR 83	ESL	BIOLOGICAL(CRAYFISH)	0.23	WSU
MAR 84	ESL	SEDIMENT	0.07	WSU
		WATER	ND-80ppq	WSU
		BIOLOGICAL(FISH)	0.9	WSU
NCBC DS 4				
SEP 80	ESL	SEDIMENT	0.07	WSU
		BIOLOGICAL(TURTLE LIVER)	0.06	WSU
		BIOLOGICAL(TURTLE ADIPOSE)	0.32	WSU
		BIOLOGICAL(TURTLE MUSCLE)	0.02	WSU
MAY 81	ESL	SEDIMENT	ND	WSU
NOV 81	ESL	SEDIMENT	ND	WSU
		BIOLOGICAL(FISH)	ND	WSU
APR 82	ESL	SEDIMENT	ND	WSU
		BIOLOGICAL(FISH)	0.07	WSU
		BIOLOGICAL(CRAYFISH)	0.29	WSU
NOV 82	ESL	SEDIMENT	ND	WSU
		BIOLOGICAL(FISH)	0.04	WSU
APR 83	ESL	BIOLOGICAL(FISH)	0.18	WSU
MAR 84	ESL	SEDIMENT	ND	WSU
		WATER	ND-50ppq	WSU
		BIOLOGICAL(CRAYFISH)	0.11	WSU
NCBC DS 5				
SEP 80	ESL	SEDIMENT	0.01	WSU
MAY 81	ESL	SEDIMENT	ND	WSU
NOV 81	ESL	SEDIMENT	0.03	WSU
		BIOLOGICAL(FISH)	0.02	WSU
NOV 82	ESL	SEDIMENT	ND	WSU
		BIOLOGICAL(COMPOSITE)	0.05	WSU
APR 83	ESL	BIOLOGICAL(COMPOSITE)	0.1	WSU
MAR 84	ESL	SEDIMENT	ND	WSU
		WATER	ND-55ppq	WSU
		BIOLOGICAL(CRAYFISH)	0.05	WSU
NCBC DS 6				
SEP 80	ESL	SEDIMENT	ND	WSU
		BIOLOGICAL(FISH)	0.11	WSU
		BIOLOGICAL(TURTLE LIVER)	0.12	WSU
		BIOLOGICAL(TURTLE ADIPOSE)	0.88	WSU

		BIOLOGICAL(TURTLE MUSCLE)	0.03	WSU
MAY 81	ESL	SEDIMENT	0.03	WSU
		SEDIMENT	0.02	WSU
		BIOLOGICAL(FISH)	0.09	WSU
NOV 81	ESL	SEDIMENT	0.04	WSU
		BIOLOGICAL(CRAYFISH)	0.04	WSU
APR 82	ESL	SEDIMENT	ND	WSU
		BIOLOGICAL(NOT SPECIFIED)	0.02	WSU
NOV 82	ESL	SEDIMENT	0.12	WSU
		BIOLOGICAL(COMPOSITE)	0.1	WSU
		BIOLOGICAL(FISH)	0.24	WSU
APR 83	ESL	BILOGICAL(CRAYFISH)	0.02	WSU
MAR 84	ESL	SEDIMENT	0.08	WSU
		WATER	ND-90ppq	WSU
NCDC DS 7				
SEP 80	ESL	SEDIMENT	0.19	WSU
		BIOLOGICAL(FISH)	0.05	WSU
MAY 81	ESL	SEDIMENT	0.08	WSU
		SEDIMENT	0.09	WSU
		BIOLOGICAL(FISH)	0.05	WSU
NOV 81	ESL	SEDIMENT	ND	WSU
		BIOLOGICAL(FISH)	0.07	WSU
APR 82	ESL	SEDIMENT	ND	WSU
		BIOLOGICAL(CRAYFISH)	0.04	WSU
		BIOLOGICAL(FISH)	0.04	WSU
NOV 82	ESL	SEDIMENT	0.03	WSU
		BIOLOGICAL(FISH)	0.13	WSU
		BIOLOGICAL(FISH)	0.07	WSU
APR 83	ESL	BIOLOGICAL(FISH)	0.03	WSU
MAR 84	ESL	SEDIMENT	0.01	WSU
		WATER	ND-40ppq	WSU
		SUSPENDED SEDIMENT	0.15	WSU
		BIOLOGICAL(FISH)	0.07	WSU
NCDC DS 8				
SEP 80	ESL	SEDIMENT	0.01	WSU
APR 82	ESL	SEDIMENT	0.04	WSU
		BIOLOGICAL(CRAYFISH)	0.05	WSU
NOV 82	ESL	SEDIMENT	0.02	WSU
		BIOLOGICAL(CRAYFISH)	0.03	WSU
APR 83	ESL	BIOLOGICAL(CRAYFISH)	0.3	WSU
MAR 84	ESL	SEDIMENT	ND	WSU
		SUSPENDED SEDIMENT	0.15	WSU
		WATER	ND-50ppq	WSU
		BILOGICAL(CRAYFISH)	0.02	WSU

NCBC DS 9				
SEP 80	ESL	SEDIMENT	0.04	WSU
NOV 81	ESL	SEDIMENT	ND	WSU
		BIOLOGICAL((FISH)	ND	WSU
NOV 82	ESL	SEDIMENT	ND	WSU
		BIOLOGICAL(COMPOSITE)	ND	WSU
APR 83	ESL	BIOLOGICAL(FISH)	ND	WSU
MAR 84	ESL	SEDIMENT	ND	WSU
		SEDIMENT	ND	WSU
		SUSPENDED SEDIMENT	0.3	WSU
		WATER	ND-30ppq	WSU
NCBC DS 10		NO DATA		
NCBC DS 11				
MAR 84	ESL	SEDIMENT	ND	WSU
		SEDIMENT	ND	WSU
		WATER	ND-30ppq	WSU
NCBC DS 12				
MAR 84	ESL	SEDIMENT	ND	WSU
		SEDIMENT	ND	WSU
		WATER	ND-30ppq	WSU
NCBC DS 13				
MAR 84	ESL	SEDIMENT	ND	WSU
		SEDIMENT	0.02	WSU
NCBC DS 14				
MAR 84	ESL	SEDIMENT	ND	WSU
		SEDIMENT	ND	WSU
		SEDIMENT	ND	WSU
		SUSPENDED SEDIMENT	0.45	WSU
		WATER	ND-40ppq	WSU

S

SECTION V

HERBICIDE ORANGE DATA

JOHNSTON ISLAND

PACIFIC OCEAN

LOCATION & DATE	SAMPLING LAB	SAMPLE DESCRIPTION	2,4-D (ppm)	2,4,5-T (ppm)	2,3,7,8-TCDD (ppb)	ANALYTICAL LAB
TH-1						
AUG 77	OEHL	SOIL	10.1	10.8		CAL
JAN 78	OEHL	SOIL	0.8	0.1		CAL
OCT 78	OEHL	SOIL	3	4		CAL
SEP 80	ESL	SOIL			ND	WSU
JUN 81	ESL	SOIL	ND	ND	0.23	CAL
	ESL	SOIL	ND	ND	ND	CAL
	ESL	SOIL			ND	WSU
	ESL	SOIL			ND	WSU
NOV 81	ESL	SOIL	ND	ND	ND	CAL
	ESL	SOIL			ND	WSU
MAY 82	ESL	SOIL			ND	WSU
	ESL	SOIL	0.21	0.25	ND	CAL
TH-2						
AUG 77	OEHL	SOIL	12	18		CAL
JAN 78	OEHL	SOIL	2.8	0.7		CAL
OCT 78	OEHL	SOIL	1	2		CAL
NOV 81	ESL	SOIL			0.05	WSU
TH-3						
AUG 77	OEHL	SOIL	0.7	7.6		CAL
JAN 78	OEHL	SOIL	3.3	0.6		CAL
OCT 78	OEHL	SOIL	0.2	0.4		CAL
NOV 81	ESL	SOIL			0.03	WSU
TH-4						
AUG 77	OEHL	SOIL	14.4	29.3		CAL
JAN 78	OEHL	SOIL	5.6	0.1		CAL
OCT 78	OEHL	SOIL	0.2	0.4		CAL
TH-5						
AUG 77	OEHL	SOIL	12600	8750	33	CAL
JAN 78	OEHL	SOIL	11800	10200	34	CAL
OCT 78	OEHL	SOIL	7930	22000	19.1	CAL
AUG 79	OEHL	SOIL	971	2590	41	CAL
SEP 80	ESL	SOIL			7.46	WSU
JUN 81	ESL	SOIL	97	190	33	CAL
	ESL	SOIL			17	CAL
NOV 81	ESL	SOIL	3.6	8.1	4.6	CAL
	ESL	SOIL			12	WSU
MAY 81	ESL	SOIL			48	WSU
	ESL	SOIL	1.6	3.5	31	CAL
TH-6						
	OEHL	SOIL	4720	638	ND	CAL
	OEHL	SOIL	6050	1720	ND	CAL
	OEHL	SOIL	17600	10800	ND	CAL
TH-7						
AUG 77	OEHL	SOIL	1980	1250	11.3	CAL
JAN 78	OEHL	SOIL	1970	1670	7	CAL
OCT 78	OEHL	SOIL	944	628	8.2	CAL

TH-8						
AUG 77	OEHL	SOIL	1520	525	4.6	CAL
JAN 78	OEHL	SOIL	1.7	2	NO DATA	CAL
OCT 78	OEHL	SOIL	0.[illegible]	0.2	NO DATA	CAL
TH-9						
AUG 77	OEHL	SOIL	13[illegible]	[illegible]90	41.7	CAL
JAN 78	OEHL	SOIL	7800	[illegible]700	22	CAL
OCT 78	OEHL	SOIL	15700	11500	26.6	CAL
AUG 79	OEHL	SOIL	15500	15600	53	CAL
TH-10						
AUG 77	OEHL	SOIL	42600	45600	196	CAL
JAN 78	OEHL	SOIL	31[illegible]00	46600	230	CAL
OCT 78	OEHL	SOIL	387[illegible]	6[illegible]000	235	CAL
AUG 79	OEHL	SOIL	212[illegible]0	26400	130	CAL
	OEHL	SOIL 0-2 CM	29200	30200	67	CAL
	OEHL	SOIL 2-4 CM	24900	3[illegible]400	140	CAL
	OEHL	SOIL 4-6 CM	15200	24100	170	CAL
	OEHL	SOIL 6-8 CM	15600	20[illegible]00	100	CAL
	OEHL	SOIL 8-12 CM	7220	9800	42	CAL
	OEHL	SOIL 12-16 CM	9930	13600	45	CAL
	OEHL	SOIL 16-20 CM	10100	12900	55	CAL
	OEHL	SOIL 20-24 CM	9410	[illegible]50[illegible]	42	CAL
SEP 80	OEHL	SOIL			143	WSU
JUN 81	ESL	SOIL	1700	1500	23	CAL
	ESL	SOIL	1100	710	160	CAL
	ESL	SOIL			148	WSU
	ESL	SOIL			99	WSU
NOV 81	ESL	SOIL	1500	[illegible]	210	CAL
	ESL	SOIL			78	WSU
MAY 82	ESL	SOIL			157	WSU
	ESL	SOIL	700	920	80	CAL
	ESL	SOIL 0-1 IN.			143	WSU
	ESL	SOIL 1-3 IN.			449	WSU
	ESL	SOIL 3-6 IN.			124	WSU
	ESL	SOIL 6-12 IN.			43	WSU
	ESL	SOIL 0-1 IN.	5900	8100	180	CAL
	ESL	SOIL 1-3 IN.	3280	740[illegible]	220	CAL
	ESL	SOIL 3-6 IN.	5500	8100	100	CAL
	ESL	SOIL 6-12 IN.	4900	[illegible]000	43	CAL
OCT 82	ESL	SOIL			0.04	WSU
	ESL	SOIL			0.04	WSU
	ESL	SOIL 0-1.5 IN.			172	WSU
	ESL	SOIL 1.5-3 IN.			117	WSU
	ESL	SOIL 3-6 IN.			69	WSU
	ESL	SOIL 6-9 IN.			39	WSU
	ESL	SOIL 9-12 IN.			36	WSU
	ESL	SOIL 12-15 IN.			32	WSU
	ESL	SOIL 15-18 IN.			17	WSU
	ESL	SOIL 18-21 IN.			15	WSU
	ESL	SOIL 21-24 IN.			6	WSU
	ESL	SOIL 27-30 IN.			0.04	WSU
	ESL	SOIL 33-36 IN.			ND	WSU

		ESL	SOIL 45-48 IN.			ND	WSU
		ESL	SOIL 57-60 IN.			ND	WSU
		ESL	SOIL 0-1.5 IN.	1570	6090	82	CAL
		ESL	SOIL 1.5-3 IN.	1110	3740	88	CAL
		ESL	SOIL 3-6 IN.	890	3770	43	CAL
		ESL	SOIL 6-9 IN.	871	3150	27	CAL
		ESL	SOIL 9-12 IN.	601	2110	30	CAL
		ESL	SOIL 12-15 IN.	599	2140	23	CAL
	MAY 83	ESL	SOIL 1-3 IN.			115	WSU
		ESL	SOIL 3-6 IN.			67	WSU
		ESL	SOIL 9-12 IN.			43.9	WSU
		ESL	SOIL 15-18 IN.			29.9	WSU
		ESL	SOIL 21-24 IN.			27.3	WSU
		ESL	SOIL 33-36 IN.			0.15	WSU
		ESL	SOIL 45-48 IN.			0.02	WSU
		ESL	SOIL 57-60 IN.			0.05	WSU
TH-11							
	AUG 77	OEHL	SOIL	4080	3650	53.4	CAL
	JAN 78	OEHL	SOIL	2.1	3.6	ND	CAL
	OCT 78	OEHL	SOIL	5	38.5	ND	CAL
TH-12							
	AUG 77	OEHL	SOIL	1560	1370	178	CAL
	JAN 78	OEHL	SOIL	2300	1200	80	CAL
	OCT 78	OEHL	SOIL	13200	18200	111	CAL
	AUG 79	OEHL	SOIL	6530	8600	81	CAL
	SEP 80	ESL	SOIL			15.1	WSU
	JUN 81	ESL	SOIL	970	1200	55	CAL
		ESL	SOIL	710	930	72	CAL
		ESL	SOIL			33	WSU
		ESL	SOIL			47	CAL
	NOV 81	ESL	SOIL	320	570	53	CAL
		ESL	SOIL			25	WSU
	MAY 82	ESL	SOIL			85	WSU
		ESL	SOIL	35	220	65	CAL
TH-13							
	JAN 78	OEHL	SOIL	23.9	23.7	ND	CAL
	OCT 78	OEHL	SOIL	ND	0.1	NO DATA	CAL
TH-14							
	JAN 78	OEHL	SOIL	4.4	0.6	NO DATA	CAL
	OCT 78	OEHL	SOIL	0.1	0.3	NO DATA	CAL
TH-15							
	JAN 78	OEHL	SOIL	3.8	ND		CAL
	OCT 78	OEHL	SOIL	0.1	0.3		CAL
TH-16							
	JAN 78	OEHL	SOIL	1.2	0.1		CAL
	OCT 78	OEHL	SOIL	0.1	0.1		CAL
	NOV 81	ESL	SOIL			0.02	WSU

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TH-17						
JAN 78	OEHL	SOIL	5.8	6.8		CAL
OCT 78	OEHL	SOIL	0.1	0.3		CAL
MAY 82	ESL	SOIL			0.02	WSU
TH-18						
JAN 78	OEHL	SOIL	691	2920	1	CAL
OCT 78	OEHL	SOIL	2	4.9	ND	CAL
MAY 82	ESL	SOIL			0.49	WSU
TH-19						
JAN 78	OEHL	SOIL	1.3	0.2		CAL
OCT 78	OEHL	SOIL	ND	0.2		CAL
TH-20						
JAN 78	OEHL	SOIL	4.7	0.1		CAL
OCT 78	OEHL	SOIL	ND	0.1		CAL
NOV 81	ESL	SOIL			ND	WSU
TH-21						
JAN 78	OEHL	SOIL	1.0	0.3		CAL
OCT 78	OEHL	SOIL	ND	0.1		CAL
MAY 82	ESL	SOIL			ND	WSU
TH-22						
JAN 78	OEHL	SOIL	0.6	0.2		CAL
OCT 78	OEHL	SOIL	3.9	8.8		CAL
TH-23						
JAN 78	OEHL	SOIL	47.6	23.4	ND	CAL
OCT 78	OEHL	SOIL	0.9	2.4		CAL
TH-24						
JAN 78	OEHL	SOIL	3440	2130	25	CAL
OCT 78	OEHL	SOIL	9690	12100	24	CAL
AUG 79	OEHL	SOIL	19500	20600	64	CAL
TH-25						
JAN 78	OEHL	SOIL	6	4.6		CAL
OCT 78	OEHL	SOIL	20.6	38.1		CAL
OCT 82	ESL	SOIL			0.09	WSU
TH-26						
JAN 78	OEHL	SOIL	45.3	88.6	10	CAL
OCT 78	OEHL	SOIL	1.0	6.1	3	CAL
AUG 79	OEHL	SOIL	245	256	11	CAL
TH-27						
JAN 78	OEHL	SOIL	3.1	1.5	ND	CAL
OCT 78	OEHL	SOIL	0.52	5		CAL
TH-28						
JAN 78	OEHL	SOIL	26800	38800	0.2	CAL
OCT 78	OEHL	SOIL	9010	13200	ND	CAL

TH-29						
JAN 78	OEHL	SOIL	13.6	62.8	0.8	CAL
OCT 78	OEHL	SOIL	2e-01	0.6		CAL
MAY 82	ESL	SOIL			0.43	CAL
JI SS 30						
JAN 78	OEHL	SOIL	4480	2600	30	CAL
OCT 78	OEHL	SOIL	3170	4760	36	CAL
AUG 79	OEHL	SOIL	708	3270	40	CAL
JI SS 31						
JAN 78	OEHL	SOIL	71.8	303	2	CAL
OCT 78	OEHL	SOIL	0.9	6.6	ND	CAL
JI SS 32						
JAN 78	OEHL	SOIL	18800	17700	0.7	CAL
OCT 78	OEHL	SOIL	10100	20100	ND	CAL
JI SS 33						
JAN 78	OEHL	SOIL	13.8	0.4		CAL
OCT 78	OEHL	SOIL	197	151		CAL
JI SS 34						
JAN 78	OEHL	SOIL	2280	2080	29	CAL
OCT 78	OEHL	SOIL	3240	7770	152	CAL
AUG 79	OEHL	SOIL	2970	9130	150	CAL
JI SS 35						
JAN 78	OEHL	SOIL	16500	14700	8	CAL
OCT 78	OEHL	SOIL	23400	26100	ND	CAL
JI SS 36						
JAN 78	OEHL	SOIL	15300	10500	15	UOU
OCT 78	OEHL	SOIL	14200	29900	19	UOU
AUG 79	OEHL	SOIL	29200	36600	74	UOU
JI SS 37						
JAN 78	OEHL	SOIL	10800	10800	74	UOU
OCT 78	OEHL	SOIL	19900	20600	94	UOU
AUG 79	OEHL	SOIL	10900	11000	140	UOU
OCT 82	ESL	SOIL 0-1 IN.			31	WSU
		SOIL 1-3 IN.			75	WSU
		SOIL 3-6 IN.	0.7	7.6	41	CAL
		SOIL 6-9 IN.	3.3	0.6	28	CAL
		SOIL 9-12 IN.	0.2	0.4	17	CAL
		SOIL 12-15 IN.			2	WSU
		SOIL 15-18 IN.			0.17	WSU
		SOIL 18-21 IN.			0.14	WSU
		SOIL 21-24 IN.	14.4	29.3	0.14	CAL
		SOIL 27-30 IN.	5.6	0.1	0.01	CAL
		SOIL 33-36 IN.	0.2	0.4	0.03	CAL
		SOIL 45-48 IN.			ND	WSU
		SOIL 57-60 IN.			ND	WSU

JI SS 38						
JAN 78	OEHL	SOIL	2780	1230	6	UOU
OCT 78	OEHL	SOIL	12900	7840	ND	UOU
JI SS 39						
JAN 78	OEHL	SOIL	1740	1370	29	UOU
OCT 78	OEHL	SOIL	1640	2290	41	UOU
AUG 78	OEHL	SOIL	492	1530	50	UOU
JI SS 40						
JAN 78	OEHL	SOIL	11400	9350	55	UOU
OCT 78	OEHL	SOIL	21900	21900	53	UOU
AUG 79	OEHL	SOIL	12900	12900	84	UOU
JI SS 41						
JAN 78	OEHL	SOIL	11900	10600	85	UOU
OCT 78	OEHL	SOIL	26900	29700	127	UOU
AUG 79	OEHL	SOIL	36300	38700	120	UOU
SEP 80	ESL	SOIL			84	WSU
JUN 81	ESL	SOIL	2100	2000	31	CAL
		SOIL	1800	1500	110	CAL
		SOIL			96	WSU
		SOIL			75	WSU
NOV 81	ESL	SOIL	1200	1500	81	CAL
		SOIL			60	WSU
MAY 82	ESL	SOIL			79	WSU
		SOIL	390	1100	73	CAL
JI SS 42						
JAN 78	OEHL	SOIL	2470	5050	25	UOU
OCT 78	OEHL	SOIL	5460	3930	20	UOU
AUG 79	OEHL	SOIL	2650	3330	21	UOU
OCT 82	ESL	SOIL 0-1.5 IN.			24	WSU
		SOIL 1.5-3 IN.			21	WSU
		SOIL 3-6 IN.			1.5	WSU
		SOIL 6-9 IN.			0.16	WSU
		SOIL 9-12 IN.			0.03	WSU
		SOIL 12-15 IN.			0.06	WSU
		SOIL 15-18 IN.			ND	WSU
		SOIL 18-21 IN.			ND	WSU
		SOIL 21-24 IN.			ND	WSU
		SOIL 27-30 IN.			ND	WSU
		SOIL 33-36 IN.			ND	WSU
JI SS 43						
JAN 78	OEHL	SOIL	0.5	0.5	ND	UOU
JI SS 44						
JAN 78	OEHL	SOIL	2.4	23.9		UOU
JI SS 45						
JAN 78	OEHL	SOIL	0.5	2.5		UOU

JI SS 46 JAN 78	OEHL	SOIL	2830	2170	24	UOU
JI SS 47 JAN 78	OEHL	SOIL	574	25.9	ND	UOU
JI SS 48 JAN 78	OEHL	SOIL	1.2	0.4	ND	UOU
JI SS 50 MAY 82	ESL	SOIL			0.05	WSU
JI SS 51 MAY 82	ESL	SOIL			ND	WSU
JI SS 52 MAY 82	ESL	SOIL			ND	WSU
JI SS 53 MAY 82	ESL	SOIL			0.82	WSU
JI SS 54 MAY 82	ESL	SOIL			ND	WSU
JI SS 55 MAY 82	ESL	SOIL			0.08	WSU
JI SS 56 MAY 82	ESL	SOIL			0.23	WSU
JI SS 57 MAY 82	ESL	SOIL			ND	WSU
JI SS 58 MAY 82	ESL	SOIL			0.04	WSU
JI SS 59 MAY 82	ESL	SOIL			ND	WSU
JI SS 60 MAY 82	ESL	SOIL			ND	WSU
JI SS 61 MAY 82	ESL	SOIL			ND	WSU
JI SS 62 MAY 82	ESL	SOIL			ND	WSU
JI SS 63 MAY 82	ESL	SOIL			0.07	WSU
JI SS 64 MAY 82	ESL	SOIL			ND	WSU

JI SS 65				
MAY 82	ESL	SOIL	ND	WSU
JI SS 66				
MAY 82	ESL	SOIL	ND	WSU
JI SS 67				
MAY 82	ESL	SOIL	ND	WSU
JI SS 68				
MAY 82	ESL	SOIL	ND	WSU
JI SS 69				
MAY 82	ESL	SOIL	0.03	WSU
JI SS 70				
MAY 82	ESL	SOIL	ND	WSU
JI OS 1				
SEP 80	ESL	SEDIMENT	ND	WSU
NOV 81	ESL	SEDIMENT	ND	WSU
MAY 82	ESL	SEDIMENT	ND	WSU
JI OS 2				
SEP 80	ESL	SEDIMENT	ND	WSU
JI OS 3				
SEP 80	ESL	SEDIMENT	0.1	WSU
NOV 81	ESL	SEDIMENT	0.03	WSU
MAY 82	ESL	SEDIMENT	0.04	WSU
JI DW 1				
FEB 84	ESL	AIRBORNE PART.	6.3ng/filter	WSU
JI DW 2				
FEB 84	ESL	AIRBORNE PART.	5.3ng/filter	WSU
JI DW 3				
FEB 84	ESL	AIRBORNE PART.	5.8ng/filter	WSU
JI UW 1				
MAR 84	ESL	AIRBORNE PART.	ND-0.1ng/fil	WSU

DATA	CAPTURE SITE	SAMPLE DESCRIPTION	2,3,7,8-TCDD (ppt)	ANALYT. LAB
SEP 84	35&38	OCTOPUS	ND-7	WSU
	36	SNAIL	ND-24	WSU
	37	CRAB	ND-9	WSU
	39	EEL	ND-21	WSU
	42	LIVE CORAL	ND-13	WSU
	40	CRAB	ND-5	WSU
	41	SNAIL	ND-3	WSU
	43	OCTOPUS	ND-19	WSU
	11	MENIPACHI	ND-5	WSU
	10	MOANA	ND-4	WSU
	21	MOANA	ND-10	WSU
	26	RED SNAPPER (MUSCLE)	ND-10	WSU
	26	RED SNAPPER (LIVER)	ND-14	WSU
	26	RED SNAPPER (FAT)	ND-25	WSU
	28	PALANI (MUSCLE)	ND-10	WSU
	28	PALANI (LIVER)	ND-15	WSU
	28	PALANI (FAT)	NR	WSU
	32	TRIGGER FISH (MUSCLE)	ND-10	WSU
	32	TRIGGER FISH (LIVER)	18.00	WSU
	12	MOANA PAPA (MUSCLE)	ND-10	WSU
	12	MOANA PAPA (LIVER)	ND-35	WSU
	24	MOANA KALI (MUSCLE)	ND-73	WSU
	24	MOANA KALI (LIVER)	ND-10	WSU
	33	MOANA PAPA (MUSCLE)	ND-300	WSU
	33	MOANA PAPA (LIVER)	ND-10	WSU
	17	MOANA	ND-4	WSU
	1	SHEEPHEAD	ND-1	WSU
	22	HALALU	ND-2	WSU
	20	DRACULA	ND-3	WSU
	31	MOANA	ND-2	WSU
	23	MOANA	ND-1	WSU
	34	TRIGGER FISH	ND-1	WSU
	34	TRIGGER FISH	ND-3	WSU
	34	TRIGGER FISH (MUSCLE)	ND-1	WSU
	34	TRIGGER FISH (LIVER)	ND-6	WSU
	3	PALANI	ND-1	WSU
	14	O'PAKA PAKA (MUSCLE)	ND-1	WSU
	14	O'PAKA PAKA (LIVER)	ND-7	WSU
	29	O'PAKA PAKA (MUSCLE)	ND-1	WSU
	29	O'PAKA PAKA (LIVER)	ND-1	WSU
	15	PAPIO (MUSCLE)	ND-1	WSU
	15	PAPIO (LIVER)	ND-1	WSU
	15	PAPIO (FAT)	ND-8	WSU
	7	PAPIO (MUSCLE)	ND-3	WSU
	7	PAPIO (LIVER)	ND-6	WSU
	7	PAPIO (FAT)	ND-48	WSU
	6	PARROT FISH (MUSCLE)	ND-1	WSU
	6	PARROT FISH (LIVER)	ND-22	WSU
	6	PARROT FISH (FAT)	ND-604	WSU
	16	PAPIO (MUSCLE)	ND-1	WSU
	16	PAPIO (LIVER)	ND-7	WSU
	16	PAPIO (FAT)	ND-6	WSU

13	BLUE ULUA (MUSCLE)	ND-1	WSU
13	BLUE ULUA (LIVER)	ND-3	WSU
13	BLUE ULUA (FAT)	ND-18	WSU
7	PARROT FISH (MUSCLE)	ND-3	WSU
7	PARROT FISH (LIVER)	ND-3	WSU
8	DRACULA	ND-7	WSU
38	A HOLE HOLE	ND-2	WSU
38	A HOLE HOLE	ND-1	WSU
38	A HOLE HOLE	ND-31	WSU
38	A HOLE HOLE	ND-18	WSU
30	A HOLE HOLE	ND-8	WSU
38	A HOLE HOLE	ND-27	WSU
25	HINALAYA	ND-15	WSU
5	RED WEKE	ND-53	WSU
14	MOANA PAPA (MUSCLE)	ND-22	WSU
14	MOANA PAPA (LIVER)	ND-343	WSU
19	HINALAYA (MUSCLE)	ND-12	WSU
19	HINALAYA (LIVER)	ND-46	WSU
18	MOANA KALI (MUSCLE)	ND-10	WSU
18	MOANA KALI (LIVER)	NR	WSU
30	PALANI (MUSCLE)	ND-1	WSU
30	PALANI (LIVER)	ND-3	WSU
27	DRACULA (MUSCLE)	ND-7	WSU

SECTION VI

ISOMER ANALYSIS DATA

NCBC SS 17, JUNE 1979, WSU

(cm)	DCP (ppm)	TCP (ppm)	2,4-D (ppm)	2,4,5-T (ppm)	2,4-D,BE (ppm)	2,4,5-T,BE (ppm)	OE (ppm)	2,3,7,8-TCDD (ppb)
0-2	ND-100	282	17300	46900	ND-100	86.2	ND-100	480
2-4	199	945	67800	62300	268	5940	ND-100	510
4-6	ND-100	114	13500	12200	ND-100	260	ND-100	150
6-8	ND-100	118	9540	10200	ND-100	319	ND-100	160
8-12	ND-100	129	20500	16500	494	668	ND-100	300
12-16	ND-100	59.6	17400	13800	ND-100	9.5	ND-100	380
16-20	19	29.4	1070	1020	2.2	10.2	ND-1	30.2
20-24	18	28	640	493	0.8	5.1	ND-1	11.6
24-39	3.3	8	273	49.4	0.2	0.9	ND-1	ND-.48
39-55	0.8	1.1	61.3	71.9	1.6	3.6	ND-1	1.48
55-70	1	0.8	39.9	39.3	0.4	1.0	ND-1	0.78

FEBRUARY 1985, WSU

	HS 7 (ppm)	NCBC (ppm)	JI TH 1 (ppm)	NEAT HO (ppm)	NEAT HO (ppm)	NEAT HO (ppm)
2,3,7,8-TCDD	117	343	ND-43	28.3	9.8	4880
2,3,7,8-TCDF	1.4	ND-4.	4.0	48.8	39.1	59.6
TCDDs	120	354	64.9	560	12.4	5030
TCDFs	3.0	52.2	30.9	278	159	115
PCDDs	ND-.049	0.7	30.4	194	ND-.59	ND-6.73
PCDFs	3.9	11.5	35.6	271	114	102
HxCDDs	ND-.026	ND-.1	36.1	197	ND-.23	87.4
HxCDFs	0.3	ND-.0	2.9	26.8	0.4	2.2
HpCDDs	0.4	ND-.1	33.4	167	ND-.31	1.7
HpCDFs	0.5	ND-.1	1.9	15.1	ND-.08	1.6
OCDDs	0.2	ND-.1	8.7	152	ND-.41	7.7
OCDFs	0.1	ND-.1	2.5	12.8	0.4	4.3

ARSINIC (ppm)
FEBRUAURY 1985, WSU

HS7	ND-1.3
NCBC SS 17	22.2
JI TH 10	1
C-52A G2 2-3 in.	1
C-52A G2 4-5 in.	ND-1.1
C-52A G2 6-7 in.	ND-1.1

SECTION VII

SITE MAPS

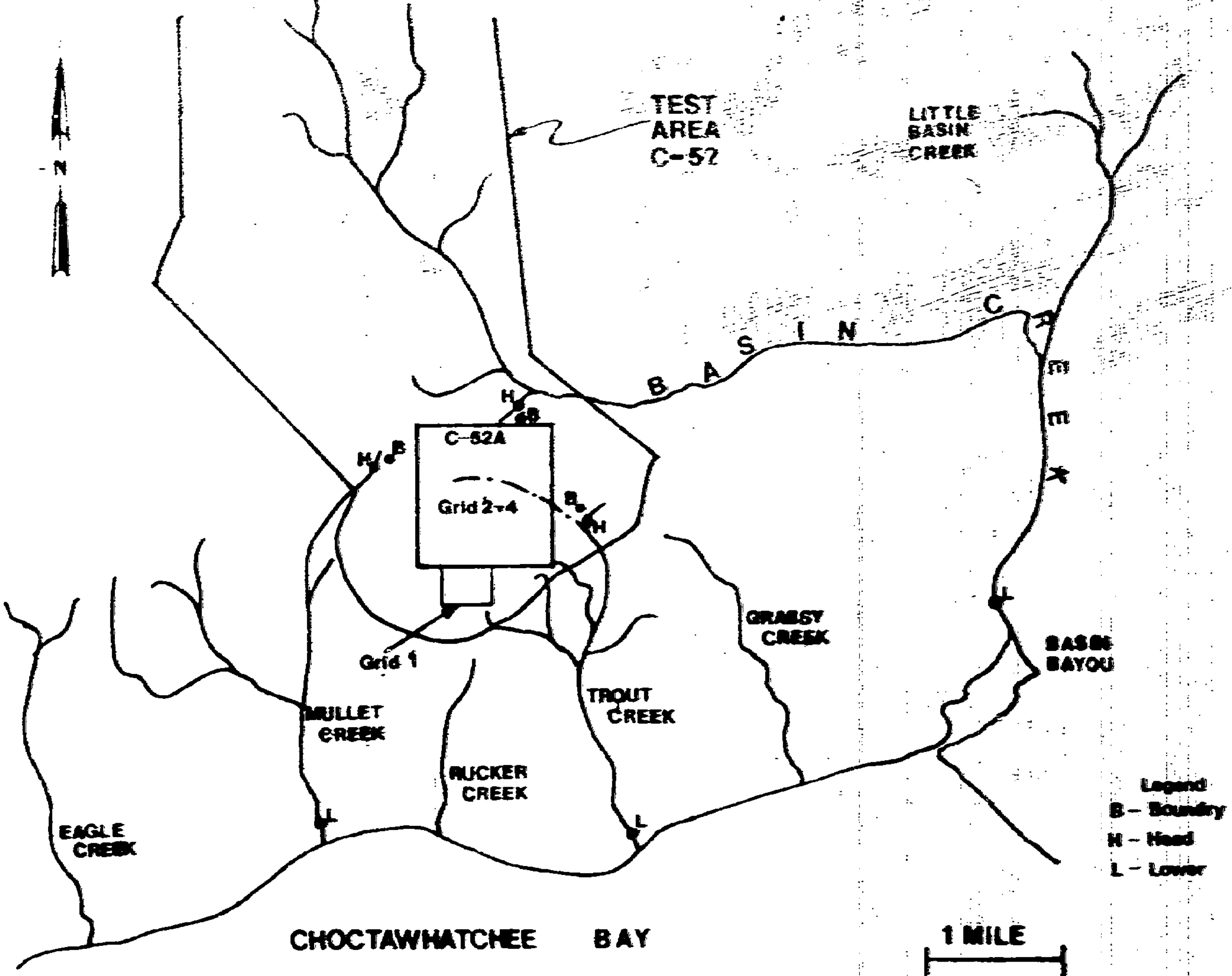


Figure 1. Test Area C 52A. Eglin AFB FL

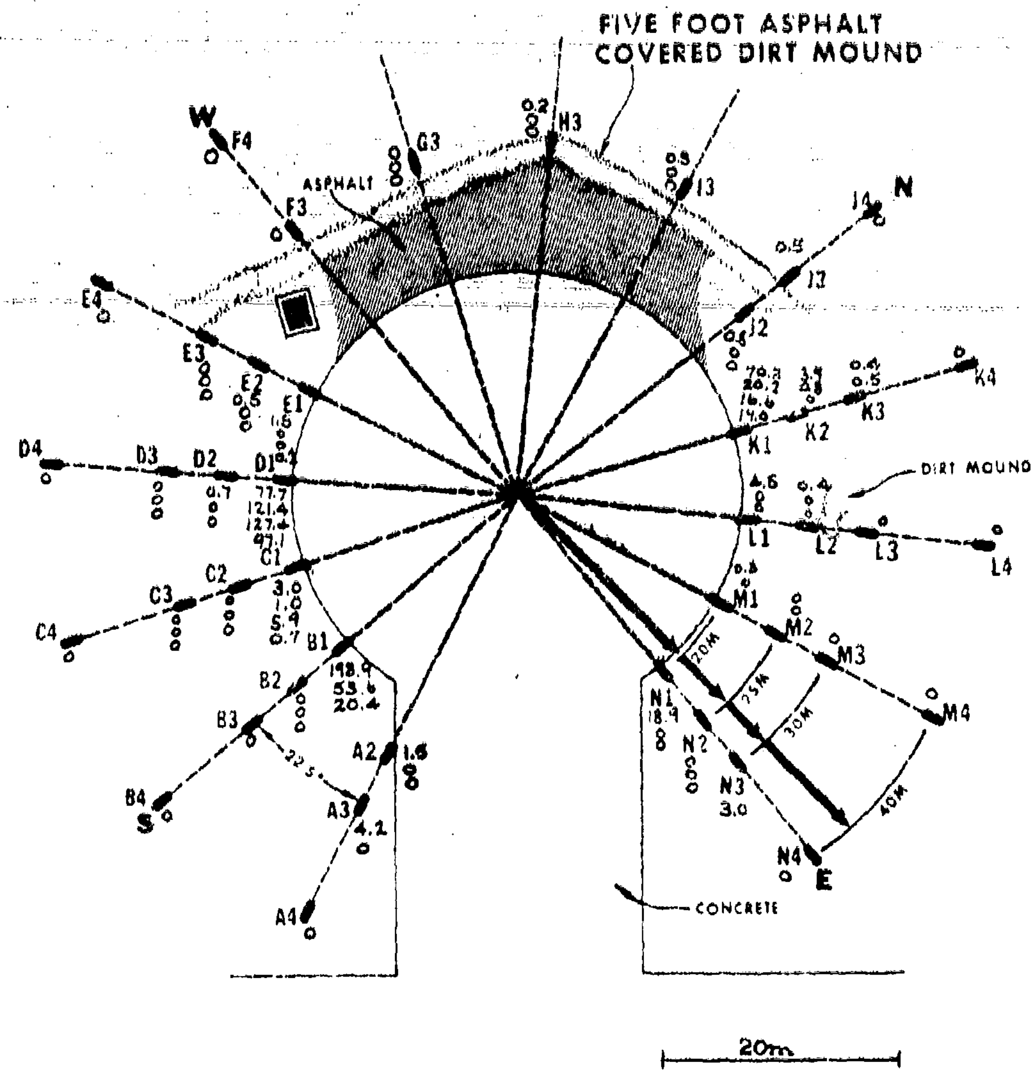


Figure 2. Hardstand 7, Eglin AFB FL

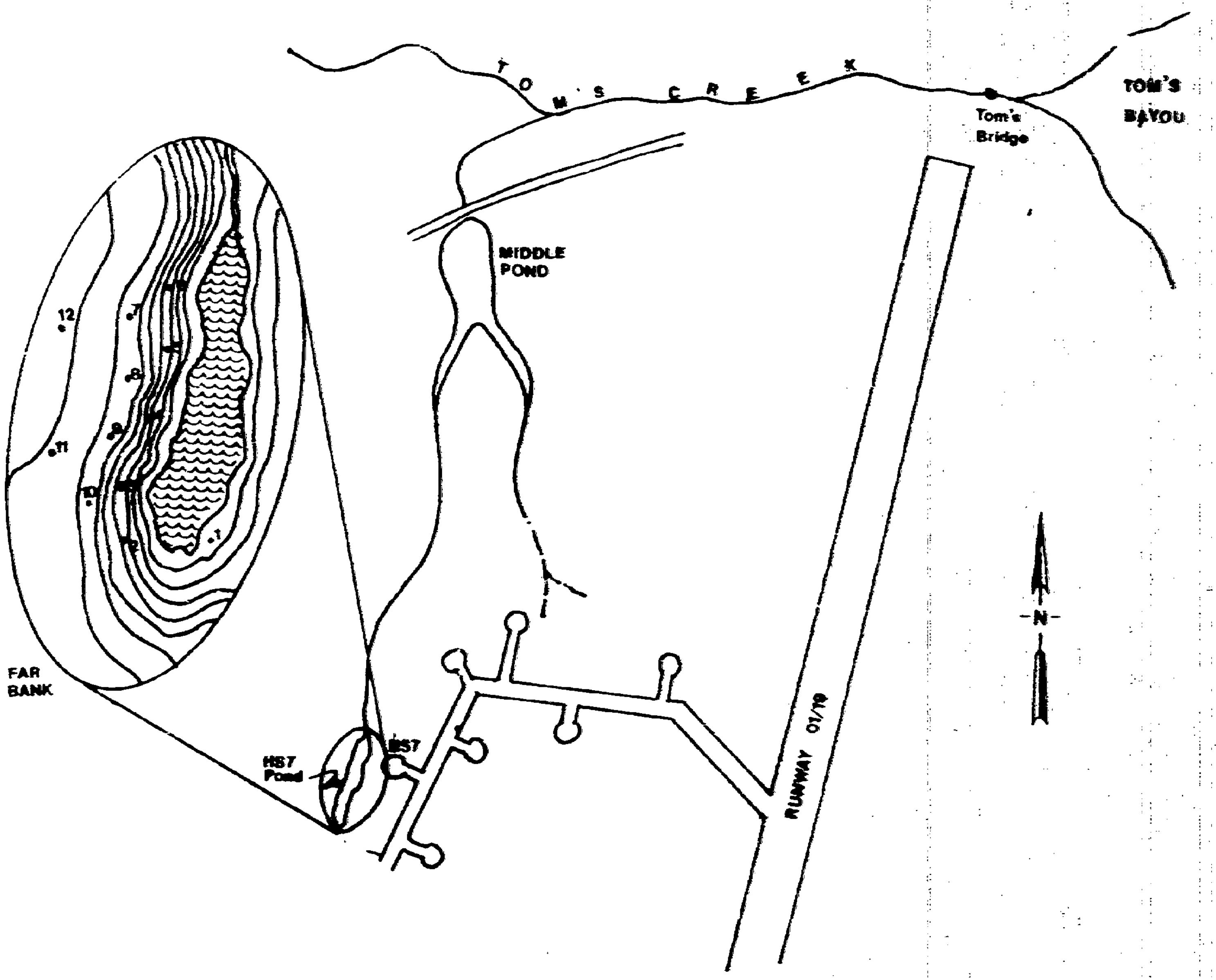
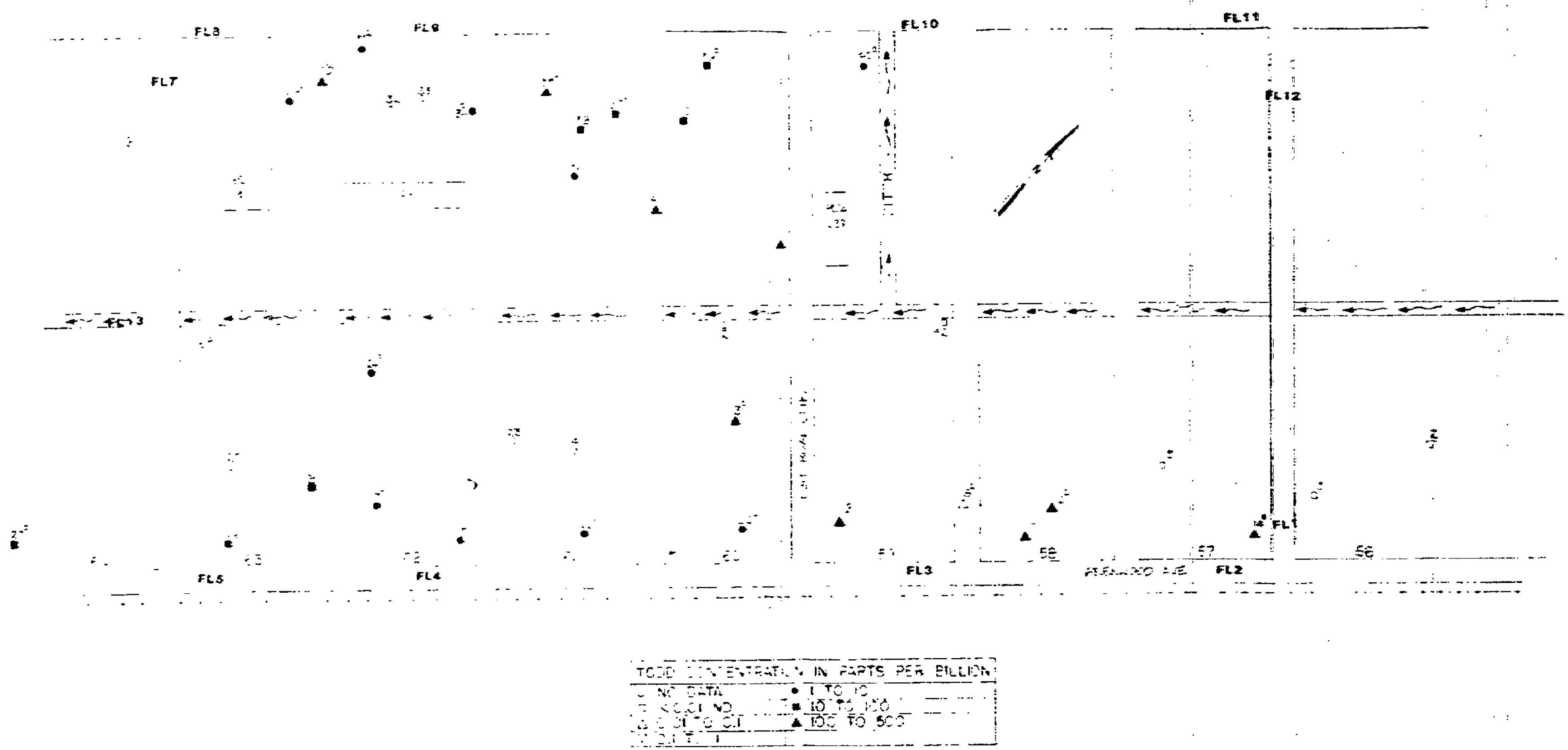


Figure 3. Hardstand 7 Drainage



SAMPLES COLLECTED IN 1977-79 AND ANALYZED BY THE UNIVERSITY OF UTAH. ALL OTHER SAMPLES COLLECTED IN 1960-62 AND ANALYZED BY WRIGHT STATE UNIVERSITY AND CALIFORNIA ANALYTICAL LABORATORY

Figure 4. Herbicide Orange Storage Site, Naval Construction Battalion Center, Gulfport MS

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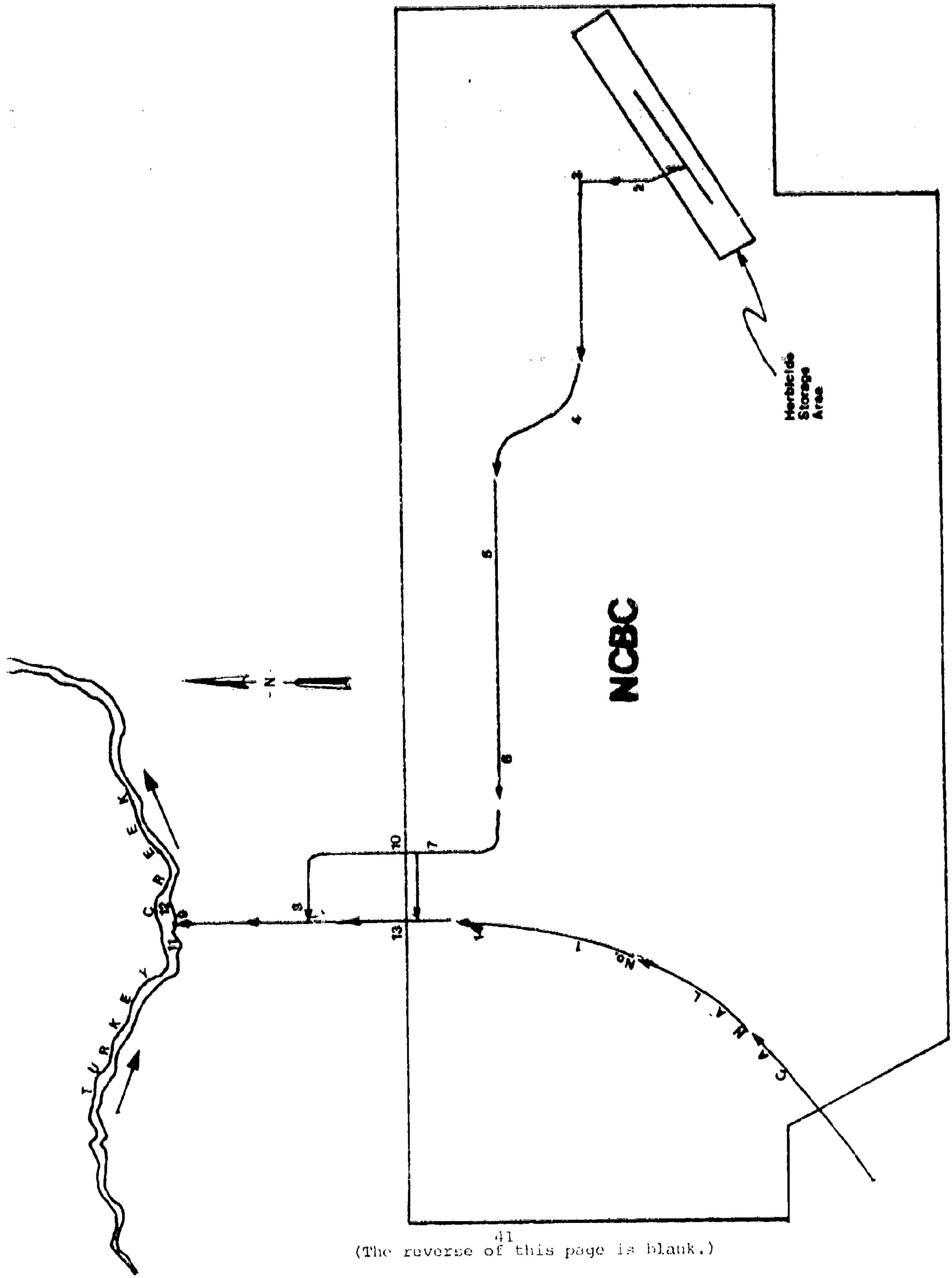

Figure 5. Storage Site Drainage System. NCBC

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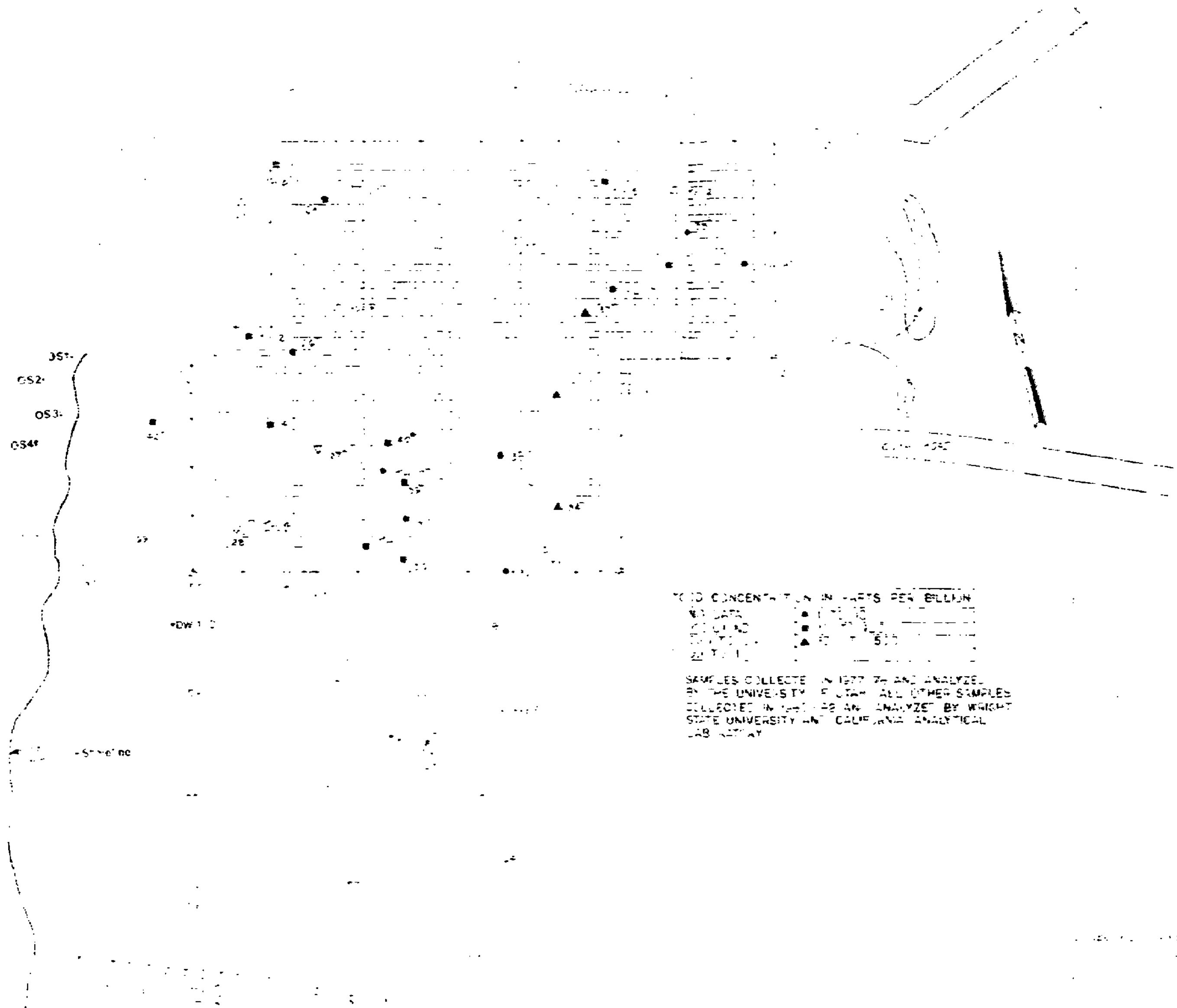
OS2
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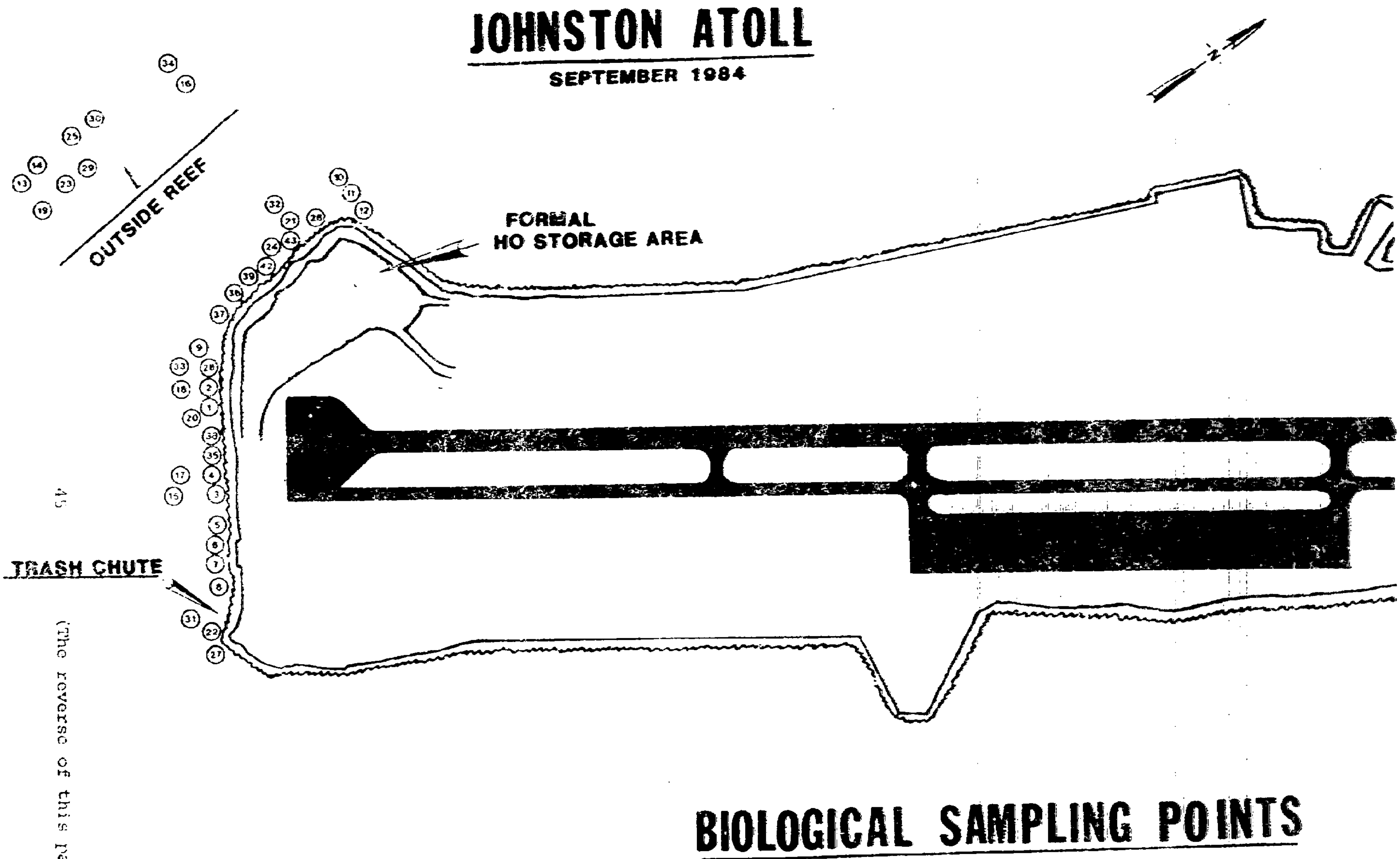

Figure 7. Johnston Island Fish Capture Sites

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